



Financial Inclinations of Visitors to the Wielkopolska National Park

*Adam Zydroń**, *Dariusz Kayzer*, *Michał Fiedler*, *Mariusz Korytowski*

The Poznań University of Life Sciences, Poland

**corresponding author's e-mail: adzyd@up.poznan.pl*

1. Introduction

Forest ecosystems serve a multitude of functions, among which an increasingly important role is being played by their social function. For many years forests have been associated with tourism and recreation, as a result of which demand for advanced methods to measure the value of non-productive functions of forests has been growing (Courtney & Hill 2006). The value of the natural environment is difficult to determine. In the case of forested areas valuation may not be limited to the economic value of the forest or other elements of material value. Ground-breaking concepts for the appraisal of the natural environment were presented in the 1940's (Hotelling 1949) and they were based on the willingness to pay for an opportunity to visit a specific location. The contingent valuation method provides a personal estimation of changes in the quality of the environment based on the conventional welfare theory (Scarpa et al. 2000). Using this method monetary values may be (Kahneman & Knetsch 1992, Arrow et al. 1993, Carson 1997). The contingent valuation has been applied not only in nature conservation (Mueller 2014), but also in other areas, e.g. medicine (Willan et al. 2001, O'Brien et al. 2002). This method has been used e.g. to appraise the value of the the Białowieża Forest (Giergiczny 2009). ascribed to the natural environment, because social attitudes may be to a certain extent systematised and thus methods commonly applied in economics may be used.

The contingent valuation method in the appraisal of non-market benefits derived from the environment has been applied on a mass scale within the last few decades (Mitchell & Carson 1989, Kahneman et al. 1992).

The contingent valuation method providing information on Willingness to Pay (WTP) and Willingness to Accept (WTA) was used in this study to determine the sense of nature value for a landscape dominated by forests within the boundaries of a national park in central Poland. The aim of this study was to identify financial inclinations based on the WTP and WTA approach among visitors to the Wielkopolska National Park.

2. Study area

The Wielkopolska National Park was established based on the ordinance of the Council of Ministers of 16 April 1957 with the boundaries comprising an area of 9600 ha, of which approx. 5100 ha are directly administered by the Park. In 1996 a new resolution of the Council of Ministers concerning WNP changed its area to 7584 ha and created the protection zone around the Park, which joint area together with the Park itself is 14 840 ha. The municipal areas of Puszczykowo, Mosina and Stęszew were excluded from the Park. The Wielkopolska National Park is situated approx. 15 km south of the city of Poznań and it has convenient bus and railway connections with the city (the Poznań-Wrocław line), while through Poznań, thanks to numerous fast trains, it is well connected with Warszawa (www.wielkopolskipn.pl accessed 02.02.2020). Localization of WPN near Poznan makes this park similar in character to the Kampinos National Park localized near Warsaw, so both parks serve as if they were city parks. The Park was established to protect the relief formed by the action of the Scandinavian ice-sheet as well as diverse plant communities and many animal species (Fig. 1). (Wyczyński 2006). The structure of revenues to the budgets of national parks is dominated by external sources in the form of subsidies from the state budget and funds obtained from various organizations and support funds (EU funds, Forest Fund, NFOŚiGW, WFOŚiGW). Whereas, in WPN in the year 2016, the touristic access generated revenues more than twenty times lower than the costs.

3. Methods

This study was based on a set of data provided by a questionnaire survey conducted in the Wielkopolska National Park, in the communes in its vicinity, as well as on-line. Only questionnaires filled in by individuals who actually visited the Park were used in this study. A total of 1450 questionnaires were collected and they were subsequently used as a source of information to determine the social value of the park (for this reason only the questionnaires, in which the respondents declared they visited the Park, were included in the analyses (1332 questionnaires). The sociological characteristics of the respondents are presented in Table 1.

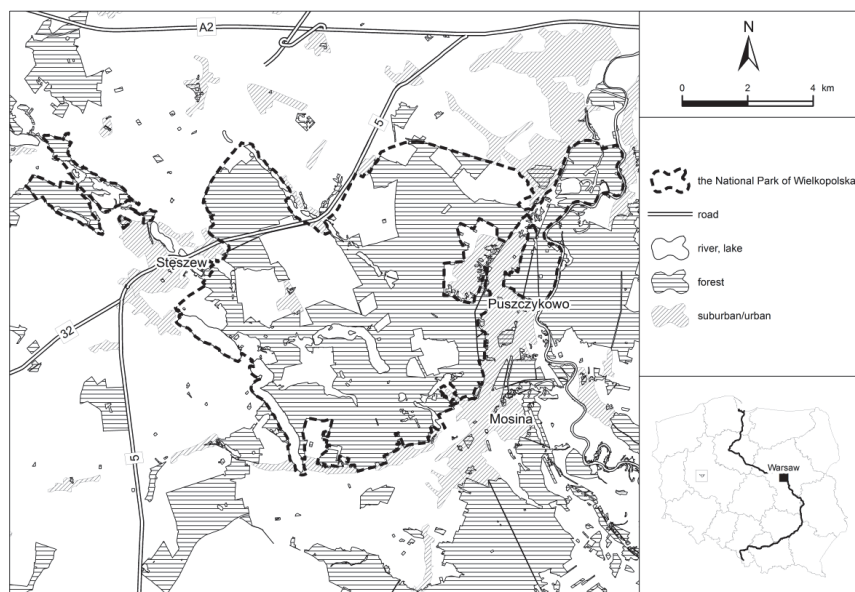


Fig. 1. Location of the study area - the Wielkopolska National Park

Source: the Wielkopolska National Park 2020

Table 1. Sociological characteristics of respondents

Sociological trait	Category of sociological trait	Percentage share in %
Sex	Female	61.0
	Male	39.0
Age	below 18 years	15.1
	18-25 years	37.1
	26-40 years	23.1
	41-60 years	20.1
	over 60 years	4.6
Monthly net income per person	Max. 100 zł	0.6
	From 100 to 200 zł	2.0
	From 200 to 500 zł	9.0
	From 500 to 1000 zł	26.1
	From 1000 to 2 500 zł	43.4
	Over 2 500 zł	18.9

Table 1. cont.

Sociological trait	Category of sociological trait	Percentage share in %
Education	elementary	15.8
	Vocational	5.6
	Secondary	41.8
	higher	36.8
Profession	Student	38.5
	Office worker	16.6
	Manual worker	5.1
	Scientific worker	5.3
	Services and retail	8.0
	Farmer	2.0
	Forester	1.0
	Business owner	6.5
	Schoolchild	8.4
	Professional	4.4
	Unemployed/not in employment	4.4

The questionnaire was preceded by an introduction, which briefly presented the history and characteristics of the park. It contained information concerning the purpose of the questionnaire, i.e. estimation of the social value of the natural environment in the Wielkopolska National Park in terms of benefits related to leisure and recreation. It was stressed in the Introduction that the questionnaire was conducted by employees of the Poznań University of Life Sciences and it is anonymous, while its results would be used only for scientific purposes.

The second part of the questionnaire was composed of 27 closed and open questions, which referred to the preferences and frequency of visits to the park by respondents. The aim of this part of the questionnaire was to determine the propensity of the respondents to transfer a certain amount of money to the visited location, or in the case of a lack of a response or a negative attitude to incurring costs for environmental protection – to identify the cause for such a declaration. The aim of the questions was also to estimate the amount of money which would be accepted by the Park users as compensation for the prohibition to enter the Park or the amount they would donate for the use of the park. The questionnaire was completed with questions concerning socio-economic aspects and referring

to e.g. the age and sex of respondents, place of residence, approximate net income per person, education and professional situation, attitude to paying fees for environmental protection, membership in environmental organisations and evaluation of sincerity of their responses.

The questionnaire survey was conducted in the period from 1 January to 31 December 2012. In order to prevent collection of data only from individuals regularly using the Park services, which would lead to excessive narrowing of the subject of the study, the process of data acquisition was carried out in three ways. The highest number of questionnaires were left in public buildings and in the seat of the WNP to be filled by residents of the communes located in the vicinity or within the Park boundaries. Next following the assumptions of the classical environment valuation model face-to-face interviews were conducted directly in the park. The last method of data collection for analyses was to provide an interactive on-line questionnaire. Such a data acquisition process was performed on the national scale and the primary aim was to verify the value of the Wielkopolska National Park to individuals who had never visited it.

Data collected through the questionnaire survey were collected and entered in the Excel programme by Microsoft Office. Applying the zero-one system the obtained responses were ascribed the following values in the Table 2: 1 – when the respondent provided an answer, 0 – in the case of no answer given, in the case of open questions – the response in the numerical or text form (Fig. 2).

In order to establish the value of the Wielkopolska National Park two approaches were adopted to economic valuation of non-market goods. The contingent valuation method is based on the determination of the value of goods based on the identified values of Willingness to Pay (WTP) and Willingness to Accept (WTA). The WTP value specifies the maximum amount which respondents are able to pay in exchange for the possibility to use a given good or for its existence. In turn, WTA is based on the amount they are willing to accept as a compensation for the inability to use of a good or its elements.

	C9	A	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	
			miejsce ankiety	wcale	kilka razy w zyciu	raz na rok	kilka razy w roku	raz na miesiac	raz na tydzien	częściej	częstość odwiedzenia WPN	1 dzień	2 dni	5 dni	7 dni	więcej dni	Gotowość dni	0 złotych	10 złotych	25 złotych	50 złotych	100 złotych	200 złotych	300 złotych	400 złotych	Wielkość deklarowanej opłaty	odległość od WPN [km]	Wielkość rekompensaty	bardzo dobrze	dobrze	umiarkowanie	slabo	zle	nie mam zdania	
2																																			
3	Lp.																																		
9	6	Mosina								6	6	1				1	0	0	0	0	0	0	0	0	0	0	100	1							
10	7	Poznań			2						2					0	0	0	0	0	0	0	0	0	0	20	100							1	
11	8	Poznań			2											0	0	0	0	0	4					20	100							1	
12	9	Poznań				3					3		4			4	0	0	0	0	0	0	0	0	0	20	70		1					1	
13	10	Tarnowo Pod.		0							0					0	0	0	0	0	0	0	0	0	0	20	70							1	
14	11	Poznań				3					3					5	5	0	0	0	0	0	0	0	0	20	70							1	
15	12	Śleszew								6	6					0	0	0	0	0	0	0	0	0	0	2	70							1	
16	14	Puszczykowo								6	6		3			3	3	0	0	0	3				3	0.3		1							1
17	15	Swarzędz		0							0					0	0	0	0	0	0	0	0	0	0	26								1	
18	16	Poznań		0							0					0	0	0	0	0	0	0	0	0	0	10	0							1	
19	17	Poznań				3					3					0	0	0	0	0	4				4	20	2000	1							1
20	18	Poznań			2						2					0	0	0	0	0	0	0	0	0	0	25	1000								1
21	19	Poznań				3					3					5	5	0	0	0	3				3	25	50								1
22	20	Borek Wilk.		0							0					0	0	0	0	0	0	0	0	0	0	80									1

Fig. 2. A fragment of the Excel contingency table with questionnaire results; Source: the authors' study

3.1. The logit model approach

The study applied the logit model method, which was used to determine dependencies between inclinations of residents to pay fees for use of the Wielkopolski National Park and selected explanatory variables (Czerwińska-Kayzer 2002, 2013, Cramer 2003). The main concept in this research method was to identify factors, which differentiate the analysed propensity among the population of park visitors to pay fees and accept compensation for prevention of use of park goods. Based on the conducted studies, primarily the standardised interview, the following variables were distinguished:

- the frequency of visits to the Wielkopolska National Park (x_1);
0 – none, 1 – once a year, 2 – several times a year, 3 – once a month, 4 – once a week, 5 – more frequently,
- knowledge concerning the Wielkopolska National Park (x_2);
0 – very limited, 1 – poor, 2 – moderate, 3 – good, 4 – very good,
- willingness to work (number of days) for the Wielkopolska National Park (x_3); 0 – no willingness to work as a volunteer, 1 – 1 day, 2 – 2 days, 3 – 5 days, 4 – 7 days, 5 – more days,
- age of respondent (x_4)
- size of place of residence (x_5); 1 – village, 2 – town up to 20 thousand, 3 – town from 21 thousand to 100 thousand, 4 – city over 100 thousand,
- mean net income per person (x_6); 1 – max. 1000 PLN, 2 – max. 2500 PLN, 3 – over 2500 PLN,
- education (x_7); 1 – elementary, 2 – vocational, 3 – secondary, 4 – higher,
- attitude to financial requirements of environmental protection (x_8); 1 – moderate, 2 – support, 3 – fully support, -1 – against, -2 – strongly against
- membership in environmental organisations (x_9); 1 – I am not a member, 2 – I used to be a member, 3 – I am a passive member of environmental organisations, 4 – I am an active member of environmental organisations
- distance from WNP (x_{10}).

Next the inclinations of residents to pay fees for the possibility to use the services of the Wielkopolska National Park or propensity to obtain a hypothetical compensation in the case of a hypothetical ban on visits to the Park (y) were presented in the form of a logistic regression equation:

$$\ln\left(\frac{y}{1-y}\right) = a_0 + a_1x_1 + a_2x_2 + \dots + a_{10}x_{10}$$

where: $a_0, a_1, a_2, \dots, a_{10}$ are regression coefficients. The measure y takes the 0 value in a situation of a lack of willingness of the respondent to pay fees for the possibility to use the Wielkopolska National Park and a lack of expectation to receive compensation in the case of a hypothetical prevention of use of the Park goods, while the values of 1 in the opposite cases.

3.2. The aim and scope of the study

The most important aim of this study was to determine willingness of individuals actively using the environmental goods to pay fees for the Wielkopolska National Park. Socio-economic factors affecting the WTA values were identified based on the collected questionnaire material (covering the period from 1 January 2012 to 31 December 2012). The questionnaire survey was conducted in the communes of the Poznań county, the city of Poznań as well as respondents from other regions of Poland. The object scope of this study concerned data collected from questionnaires determining preferences of respondents, their socio-economic characteristics, as well as costs related to the WTA for environment use. The subject scope of this study covered the area of the Wielkopolska National Park.

4. Results

The logit model was applied to establish the potential inclinations of the general public to incur costs and the expectations of compensation in the case of a hypothetical ban on the use of the Wielkopolska National Park goods. Table 2 presents the evaluation of explanatory variables describing inclinations of respondents visiting the Wielkopolska National Park to pay fees for the Park. Analyses of the test results using multiple regression indicated that the willingness to pay fees depends mainly on the attitude of respondents to financial requirements environmental protection, their knowledge concerning the Wielkopolska National Park and membership in environmental organisations. The assessed regression coefficients for the investigated variables are positive, which shows that the propensity to incur costs for the Wielkopolska National Park increases with an increase in the respondents' awareness of nature conservation problems.

Based on the conducted analyses it may be observed that actions enhancing public environmental awareness have a positive effect on the attitude of the general public to incurring costs for the environment. In contrast, failure to provide environmental education results in the lack of interest in nature conservation on the part of respondents, manifested in their lack of declared willingness to allocate funds, as established based on the WTP method.

Table 2. Regression coefficients in the model describing inclinations of respondents visiting the Wielkopolska National Park to pay fees for the Park

Explanatory variable	Regression coefficient	Test statistic	Empirical significance level	Confidence interval
Constant	-0.2493	-0.411	0.681	(-1.440; 0.941)
Frequency of visits to the Wielkopolska National Park (x_1)	-0.0246	-0.320	0.749	(-0.175; 0.126)
Knowledge concerning the Wielkopolska National Park (x_2)	0.2635	2.368	0.018	(0.045; 0.482)
Willingness to work (number of days) for the Wielkopolska National Park (x_3)	0.1009	1.525	0.128	(-0.029; 0.231)
Age (x_4)	-0.1952	-1.604	0.109	(-0.434; 0.044)
Size of place of residence (x_5)	-0.0366	-0.466	0.641	(-0.191; 0.118)
Mean net monthly income per person (x_6)	-0.0292	-0.222	0.824	(-0.288; 0.229)
Education (x_7)	-0.0332	-0.247	0.805	(-0.298; 0.231)
Attitude to financial requirements of environmental protection (x_8)	0.2705	3.375	0.001	(0.113; 0.428)
Membership in environmental organisations (x_9)	0.6532	2.756	0.006	(0.188; 1.119)
Distance from WNP (x_{10})	0.0034	1.342	0.180	(-0.002; 0.008)

Source: the authors' study

Table 3. Regression coefficients in the model describing possibility to receive compensation by visitors to the Wielkopolska National Park in the case respondents are prohibited to use the Park goods

Explanatory variable	Regression coefficient	Test statistic	Empirical significance level	Confidence interval
Constant	-0.0430	-0.080	0.936	(-1.099; 1.013)
Frequency of visits to the Wielkopolska National Park (x_1)	0.0481	0.671	0.502	(-0.093; 0.189)
Knowledge concerning the Wielkopolska National Park (x_2)	0.0965	0.938	0.349	(-0.105; 0.298)
Willingness to work (number of days) for the Wielkopolska National Park (x_3)	0.0062	0.114	0.909	(-0.101; 0.113)
Age (x_4)	-0.4020	-3.406	0.001	(-0.634; -0.170)
Size of place of residence (x_5)	0.2072	2.710	0.007	(0.057; 0.357)
Mean net monthly income per person (x_6)	-0.0019	-0.015	0.988	(-0.250; 0.246)
Education (x_7)	-0.2848	-2.181	0.030	(-0.541; -0.028)
Attitude to financial requirements of environmental protection (x_8)	0.3406	3.924	<0.001	(0.170; 0.511)
Membership in environmental organisations (x_9)	0.1650	1.300	0.194	(-0.084; 0.414)
Distance from WNP (x_{10})	0.0057	2.458	0.014	(0.001; 0.010)

Source: the authors' study

Additionally, education of visitors to the Wielkopolska National Park, their mean net income per person, the size of place of residence or frequency of visits to the Park were found to have no impact on the respondents' willingness to pay fees for the Wielkopolska National Park. This means that the general public, regardless of the status and social origin, declares similar opinions on the need to finance nature conservation.

Analyses of the results of testing the significance of individual explanatory variables (Table 3) showed that receiving a hypothetical compensation in the case of prohibiting respondents from using the goods of the Wielkopolska National Park depends on the age and education of respondents, their opinions on the financial requirements of environmental protection, the size of their town of residence and on the distance of their residence from the Park. A positive effect, i.e. the willingness to receive hypothetical compensation increases with an increase of the level of an individual factor, was related e.g. with opinions on the financial requirements of environmental protection, the size of the place of residence of respondents as well their distance from the Park. It was stated that individuals having a hindered access to protected areas exhibit increased sensitivity to the prohibition of use of the Wielkopolska National Park. Moreover, a negative effect on the declared WTA was recorded for sociological traits related to the age and education of respondents. The willingness to accept compensation for the prohibition to use WPN goods decreases with an increase in age and the level of education of respondents. This shows that older people and more educated individuals appreciate the value of nature and it would be difficult for them to accept a situation of being prevented to visit the park.

5. Discussion

Based on the recorded results it was shown that a vast majority of the general public appreciates the value of the WNP, in which forested areas predominate. A definite majority of respondents declared willingness to incur costs for WNP, either as fees or volunteer work. The results confirm the trend within the society towards increased appreciation of nature value of the environment and non-material values in relation to forests (Paschalis-Jakubowicz 2004, 2005) or protected areas (Matuszewska 2003, Muszyńska-Kurnik 2010, Woś & Owczarek 2009).

Results of the conducted questionnaire survey indicate considerable interest on the part of respondents in the investigated area in terms of its use for tourism and recreation. Thanks to the improving standard of living, tourism and recreation are becoming increasingly common and this form of leisure activity is being selected by a growing part of the Polish population (Kikulski 2008). Causes for the development of tourism and recreation may be related to the changes in the hierarchy of values among the general public, first of all associating a greater

importance with leisure activities, shortening working hours, the need to break from the routine of everyday life, increasing mobility, growing incomes and wealth (Eckert & Cremer 1998, Kikulski 2008). A higher standard of environmental awareness is directly connected with the place of residence, patterns of free time activity and awareness of environmental threats, which is very often local in character (Kaczmarek 2012).

This study shows that environmental education contributes to effective environmental protection as a means leading to changes in human attitudes and behaviour affecting the environment, as also confirmed by other authors (Sikora 2012, Zydrón & Szoszkiewicz 2013, Hłobił 2010, 2012). In this study it was found that the general public, regardless of their status and social origin, declares similar opinions on the need to finance nature conservation. In turn, Gołos in his study (2018) stated significant differences in the willingness to pay (WTP) specific amounts of money depending on the socio-economic variables. Willingness to pay fees increased in the case of respondents with higher education, higher income and in the case of respondents having families. In contrast, it decreased with age (for respondents older than the mean in that survey). Some of the above-mentioned dependencies were confirmed by the results reported by Mandziuk and Pyra (2016), who stated that the lowest WTP amount for the recreation in the Otwock Town Beach (2.34 PLN/day at the mean WTP amount for the sample population at 4 PLN/day) was declared by respondents aged over 51 years. The WTP amount increased with an increase in the monthly net income. Women are willing to pay an almost 2-fold higher WTP amount than men. In turn, studies conducted in 2012 in the Wielkopolska National Park on a sample population of 1002 respondents (all respondents, both visitors and non-visitors to the WNP) indicate that the willingness to incur costs for the environment is not related to the education of respondents or their knowledge on the WNP and frequency of their visits to the Park. Additionally, it was shown that willingness to financially support environmental protection is not significantly related to the level of affluence of the population. Entrepreneurs were the vocational group most frequently willing to incur costs for that purpose, while farmers were least willing to pay (Zydrón & Szoszkiewicz 2013).

6. Conclusions

1. Willingness to pay fees for the WNP increases with the growing awareness of respondents concerning financial requirements of environmental protection, their knowledge on the Wielkopolska National Park and membership in environmental organisations.

2. Inclinations to receive hypothetical compensation for the prohibition to use the park increase with growing awareness of financial requirements related to environmental protection, the size of the place of residence of respondents and their distance from the Park, while they decrease with the respondents' age and the level of education.
3. Based on the conducted analyses it may be stated that environmental education of the general public is necessary to enhance public awareness of the need to finance measures related to conservation of the natural environment.

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References

- Adamek, A., Ziernicka-Wojtaszek, A. (2018). Ecological Awareness of the Inhabitants of the Upper Silesian Agglomeration. *Rocznik Ochrona Środowiska*, 20, 1640-1655.
- Arrow, K., Solow, R., Portney, P., Leamer, E., Radner, R., Schuman, H. (1993). Report of the NOAA panel on contingent valuation. *Federal Register*, 10, 4601-4614.
- Bateman, I.J. (2000). *Monetary valuation of environmental preferences: extending the standard economic theory of values*. Centre for Social and Economic Research on the Global Environment (CSERGE), University of East Anglia and University College, London.
- Carson, R.T., Flores, N.E., Meade, N.F. (2000). *Contingent Valuation: controversies and evidence*. Department of Economics. University of California, San Diego.
- Courtney, P. R., & Hill, G.W. (2006). Demand analysis projections for recreational visits to countryside woodlands in Great Britain. *Forestry*, 79(2), 185-200.
- Czerwińska-Kayzer, D. (2007). *Analysis of Private Farm Investments and their Funding in Poland during the Transition Period*. In: Understanding Agricultural Transition, Beckmann V., Hagedorn K. [eds] Shaker Verlag, Aachen, 329-352.
- Czerwińska-Kayzer, D. (2013). Inklincje rolników indywidualnych do realizacji inwestycji rzeczowych w gospodarstwach rolnych [Individual farmers' tendencies to make real investments in farms]. *Zeszyty Naukowe SGGW w Warszawie. Ekonomia i Organizacja Gospodarki Żywnościowej*, 104, 5-13.
- Decker, K.A., Watson, P. (2017). Estimating willingness to pay for a threatened species within a threatened ecosystem. *Journal Of Environmental Planning And Management*, 60(8), 1347-1365.
- Deluga, W. (2018). Waste Management in Public Awareness. *Rocznik Ochrona Srodowiska*, 20, 1530-1545.
- Douglas, C.M., Lorna P., Nick H., Begona A.F. (2002). Valuing the non market benefits of wild goose conservation: a comparison of interview and group based approaches. *Ecological Economics*, 43, 49-59.
- Eckert, A., Cremer, Ch. (1998). *Tourism and the environment*. Rada Europy, Polski Klub Ekologiczny. Kraków.

- Georgiou, S. (1996). The contingent valuation method. In: Andersen G., Śleszyński J. [eds.] Economic valuation of the natural environment. *Ekonomia i Środowisko*, Białystok.
- Giergiczny, M. (2009). The recreational value of the Białowieża National Forest. *Ekonomia i Środowisko*, 2(36), 116-128.
- Gołos, P. (2001). *Valuation of the economic value for the recreational function of forests based on the Gostynin-Włocławek Promotional Forest Complex*. A PhD dissertation. IBL. Warszawa.
- Gołos, P. (2018). *Social and economic aspects of non-productive functions of forests and forest management*. A monograph. Instytut badawczy Leśnictwa.
- Hłobił, A. (2010). Theory and practice of environmental education for sustainable development in Poland. *Problems of Sustainable Development*, 5(2).
- Hłobił, A. (2012). Psychological and pedagogical aspects of active teaching in biology. *Rocznik Ochrona Środowiska*, 14, 960-970.
- Hotelling, H. (1949). *Letter*. In: An Economic Study of the Monetary Evaluation of Recreation in the National Parks, Washington, DC: National Park Service.
- Kaczmarek, R. (2012). Psychological and pedagogical aspects of ecophilosophy in view of the sustainable development concept. *Rocznik Ochrona Środowiska*, 14, 983-997.
- Kahneman, Daniel & Knetsch, J.L. (1992). Valuing public goods: The purchase of moral satisfaction. *Journal of Environmental Economics and Management*, 22(1), 57-70.
- Kikulski, J. (2008b). Tourism and recreation functions of forests in Poland – public concerns and hopes (results of the first stage of research)]. *Sylvan*, 6, 63-677.
- Kikulski, J. (2011). Forest management and recreational use of forests]. *Sylvan*, 155, 269-278.
- Kikulski, J. 2008a. Preferences for recreation and needs for recreation management of forests in the Iława and Dąbrowa Forest Districts (results of the first stage of research)]. *Sylvan*, 5, 60-71.
- Kosmacz, S., Woźniak, A. (1994). Attitudes of residents in protected areas towards the Wielkopolska National Park. *Morena* 2, 93-95.
- Mandziuk, A., Pyra, A. (2016). *Valuation of the recreational function of forested areas based on the Otwock Town Beach*. *Studia i Materiały CEPL w Rogowie*, 18, 49B, 5: 143-152.
- Matuszewska, D. (2003). *Tourism functions and conflicts in selected national parks in northern and western Poland*. Bogucki Wydawnictwo Naukowe, Poznań.
- Mitchell, R.C. & Carson, R.T. (1989). *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Resources for the Future, Washington DC.
- Mueller, J.M. (2014). Estimating willingness to pay for watershed restoration in Flagstaff, Arizona using dichotomous-choice contingent valuation. *Forestry*, 327-333.
- Muszyńska-Kurnik, M. (2010). *Atrakcyjność turystyczna Tatrzańskiego Parku Narodowego [Tourism attraction value of the Tatra National Park]*. Materials of the 4th Conference “Nature in the Tatra National Park and the human”, 3, 69-73. Zakopane, 14-16.10.2010.

- O'Brien, B.J., Gersten, K., Willan, A.R., Faulkner, L.A. (2002). Is there a kink in consumers' threshold value for cost – effectiveness in health care? *Health Economics*, 11, 175-80.
- Olmsted, P., Honey-Rosés J., Satterfield T., Chan K.M. (2020). Leveraging support for conservation from ecotourists: can relational values play a role? *Journal of Sustainable Tourism*, 28(3), 497-514.
- Paschalis-Jakubowicz P. (2005). *Forests and Polish forestry in the EU – expectations and concerns*. In: The social dimension of forests: CILP, Warszawa.
- Paschalis-Jakubowicz, P. (2004). *Use of forests – moral concerns?* In: Pieńkos K. [ed.] Problems of sustainable development of tourism, recreation and sport in forests. AWF, Warszawa: 26-32.
- Scarpa, R., Chiltonc, S.M., Hutchinsond, W.G., Buongiornoe, J. (2000). Valuing the recreational benefits from the creation of nature reserves in Irish forests. *Ecol. Econ.*, 33(2), 237-250.
- Sikora, K. (2012). The effect of environmental and health education on changes in behaviour, attitudes and quality of life of schoolchildren]. *Rocznik Ochrona Środowiska*, 14, 1009-1018.
- Todorova, K. (2019). Factors affecting adoption behavior of farmers in Bulgaria - agri-environment public goods for flood risk management. *Journal of Central European Agriculture*, 20(4), 1248-1258.
- Willan, A.B., O'Brien, B.J., Leyva, R.A. (2001). Cost- Effectiveness Analysis When the WTA Is Greater Than the WTP''. *Statistics in Medicine* 20(21), 3251-3259.
- Willan, A.R., O'Brien, B.J., Leyva, R.A. (2001). Cost-effectiveness analysis when the WTA is greater than the WTP. *Statistics in Medicine*, 20, 3251-3259.
- Woś, B., Owczarek, W. (2009). *Turystyka na obszarach chronionych w percepcji społeczności lokalnej na przykładzie Stobrawskiego Parku Krajobrazowego (Tourism in protected areas as perceived by local inhabitants based on the Stobrawski Landscape Park)*.
- Wyczyński, H.J. (2006). *Wielkopolski Park Narodowy (The Wielkopolska National Park)*, An information brochure, Jeziory.
- Zydroń, A., Szoszkiewicz, K. (2013). Environmental value and public willingness to pay for that good. *Rocznik Ochrona Środowiska*, 15, 2874-2886.

Abstract

Among all the functions served by forest ecosystems an increasingly important role is played by their social function. These ecosystems have been traditionally associated with tourism and recreation and as a result also interest in the appraisal of non-productive functions of forests has been increasing. The value of the natural environment is not tangible and it may be assessed only based on subjective opinions and attitudes of the general public. A contingent valuation method based on the Willingness to Pay and Willingness to Accept has been applied to determine the nature value of a landscape dominated by forests within the boundaries of a national park in central Poland. The most important aim of this study was to determine the propensity of individuals actively using

the environmental goods to pay fees charged by the Wielkopolska National Park. Dependencies between the inclination of local residents to pay fees for the possibility to use the Wielkopolska National Park and selected variables were determined using the logit model approach. It was observed that the willingness to incur costs for the use of the Wielkopolska National Park grows with an increase in the awareness of the respondents concerning financial requirements related to environmental protection, their knowledge on the Park and membership in environmental organisations. Based on the conducted studies it was found that environmental education provided to the general public is a necessary pre-requisite to making the public aware of the need to finance actions related to preservation of the natural environment and nature conservation.

Keywords:

value of environment, national park, tourism development, nature conservation, forest

Inklinacje finansowe osób odwiedzających Wielkopolski Park Narodowy

Streszczenie

Spośród wielu funkcji jakie pełnią ekosystemy leśne coraz większe znaczenie odgrywa ich funkcja społeczna. Od dawna kojarzone są z turystyką i rekreacją wobec czego rośnie zapotrzebowanie na ocenę wartości pozaprodukcyjnych funkcji lasów. Wartość środowiska przyrodniczego nie jest mierzalna tylko ocenia się ją na podstawie subiektywnych odczuć społeczeństwa. Metoda wyceny warunkowej w formie Willingness to Pay oraz Willingness to Accept została użyta do określenia wartości przyrody krajo-brazu zdominowanego przez lasy na obszarze parku narodowego w środkowej Polski. Najważniejszym celem pracy było określenie skłonności osób korzystających czynnie z dóbr środowiska do ponoszenia opłat na rzecz Wielkopolskiego Parku Narodowego. Zależności pomiędzy inklinacją mieszkańców do ponoszenia opłat za możliwość korzystania z Wielkopolskiego Parku Narodowego a wybranymi zmiennymi objaśniającymi określono przy zastosowaniu metody logitowej. Zaobserwowano, że skłonność do ponoszenia opłat na rzecz Wielkopolskiego Parku Narodowego rośnie wraz ze wzrostem świadomości respondenta na temat finansowych wymagań ochrony środowiska, jego wiedzy o Parku oraz przynależności do organizacji ekologicznych. Na podstawie przeprowadzonych badań stwierdzono, że edukacja ekologiczna społeczeństwa jest niezbędnym elementem uświadamiania ludzi o potrzebach finansowania działań związanych z zachowaniem w naturalnym stanie środowiska przyrodniczego.

Słowa kluczowe:

wartość środowiska, park narodowy, rozwój turystyki, ochrona przyrody, las